

NAVAL WAR COLLEGE
Newport, R.I.

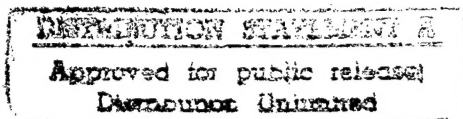
Operational Protection in the Littoral: A Matter of Sound Operational Design


by

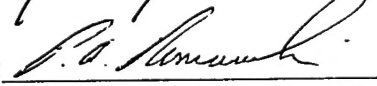
Mark Morrison
Lieutenant Commander, USN

A paper submitted to the faculty of the Naval War College in partial satisfaction of the requirements of the Department of Joint Military Operations.

The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.



Signature: 

Signature: 

Captain P. A. Romanski, USN
Faculty Advisor

7 February 1997

Paper directed by
Captain G. W. Jackson, USN
Chairman, Joint Military Operations Department

DTIC QUALITY INSPECTED 4

19970520 255

REPORT DOCUMENTATION PAGE

1. Report Security Classification: UNCLASSIFIED			
2. Security Classification Authority:			
3. Declassification/Downgrading Schedule:			
4. Distribution/Availability of Report: DISTRIBUTION STATEMENT A: APPROVED FOR PUBLIC RELEASE; DISTRIBUTION IS UNLIMITED.			
5. Name of Performing Organization: JOINT MILITARY OPERATIONS DEPARTMENT			
6. Office Symbol: C		7. Address: NAVAL WAR COLLEGE 686 CUSHING ROAD NEWPORT, RI 02841-1207	
8. Title (Include Security Classification): (U)Operational Protection in the Littoral: A Matter of Sound Operational Design			
9. Personal Authors: LCDR Mark E. Morrison, USN			
10. Type of Report: FINAL		11. Date of Report: 7 February, 1997	
12. Page Count: 28			
13. Supplementary Notation: A paper submitted to the Faculty of the NWC in partial satisfaction of the requirements of the JMO Department. The contents of this paper reflect my own personal views and are not necessarily endorsed by the NWC or the Department of the Navy.			
14. Ten key words that relate to your paper: Operational Protection, Littoral, Littoral Control, Force Protection, Doctrine, Defense Systems, Operational Design, Littoral Threat, Operational Shock, Littoral Blitz			
15. Abstract: A future conflict will undoubtedly pit the United States against an adversary with a credible coastal navy. In such an environment our ability to protect forces will be crucial to mission success. This littoral setting presents the operational commander with some very complex problems. Most notably, how does a Joint Task Force (JTF) protect its naval expeditionary component, while successfully completing its assigned mission? This paper will analyze the adequacy of current methods for operational protection of naval forces in the littoral by looking at the effect of the sea coast environment, the characteristics of a "credible" coastal navy, and current doctrine/technology. The author hopes to lead the reader to the conclusion that current methods are inadequate. Today, the United States relies too heavily on technology as a panacea for operational ills. In the fast paced littoral, technology will not be enough; also necessary will be the operational commander's ability to design operations that maximize our advantage over an adversary. As a starting point, this paper will emphasize the need for development of doctrine to support the concept of littoral control. Once established, commanders will have a framework from which innovative operational design will result.			
16. Distribution / Availability of Abstract:	Unclassified X	Same As Rpt	DTIC Users
17. Abstract Security Classification: UNCLASSIFIED			
18. Name of Responsible Individual: CHAIRMAN, JOINT MILITARY OPERATIONS DEPARTMENT			
19. Telephone: 841-6461		20. Office Symbol: C	

TABLE OF CONTENTS

ONE POTENTIAL FUTURE SCENARIO.....	iii
INTRODUCTION.....	1
THE NATURE OF THE LITTORAL THREAT TO US FORCES.....	1
US NAVY EFFORTS TO SOLVE THE PROBLEM.....	8
OPERATIONAL LEVEL SOLUTIONS USING JOINT RESOURCES.....	12
CONCLUSION.....	18
NOTES.....	19
BIBLIOGRAPHY.....	23

One Potential Future Scenario

FROM: CJCS WASHINGTON DC
TO: CINCPAC HONOLULU HI
INFO: WHITE HOUSE SITUATION ROOM WASHINGTON DC
BT

UNCLAS FOR INSTRUCTIONAL PURPOSES ONLY

OPER/RED DRAGON//

MSGID/ORDER/CJCS//

ORDTYPE/WARNORD/CJCS//

TIMEZONE/Z//

NARR/(U) THIS IS A WARNING ORDER. REQUEST CINCPAC ASSESSMENT OF THE SITUATION AND CINCPAC COMMANDER'S ESTIMATE FOR THE REMOVAL OF CHINESE MILITARY FORCES FROM TAIWAN.//

GENTEXT/SITUATION/

1. (U) CHINESE NAVAL AND AIR FORCES HAVE INITIATED OFFENSIVE MILITARY OPERATIONS AGAINST TAIWAN. NAVAL AMPHIBIOUS FORCES HAVE ESTABLISHED BEACH HEADS AT SINCHU AND VICINITY OF TAIPEI. NAVAL FORCES HAVE BEGUN REINFORCING EXPEDITIONARY UNITS WITH PLA REGULAR FORCES AND SUPPLIES.

2. (U) PLA(N) PRESENCE IN THE STRAITS OF TAIWAN IS HIGH. 2 HAN SSN'S AND 3 KILO SS'S ARE PRESUMED TO BE AT SEA AND OPERATING IN DEFENSE OF THE TRANSPORT EFFORT. SURFACE UNITS UNDERWAY INCLUDE LUHU AND LUDA CLASS DDG'S, JIANGWIE FFG'S AND NUMEROUS HUANGFEN MISSILE PATROL BOATS.

3. (U) AIR FORCES ARE OPERATING IN SUPPORT OF LAND AND NAVAL FORCES. EXPECT TO ENCOUNTER SU-27 FLANKERS, SHENJANG J-6, XIAN B-6 AND SHENJANG FIXED WING AIRCRAFT IN ADDITION TO NUMEROUS NAVAL HELICOPTERS. ANTICIPATE A FULLY OPERATION IADS PROTECTING LAND FORCES IN THE VICINITY OF BEACH HEADS AND COASTAL CHINA.

4. (U) COASTAL DEFENSE BATTERIES INCLUDING CSSC-3 AND CSSC-301 ASCMs HAVE BEEN SEEN EMBARKED ON NAVAL TRANSPORTS AND WILL LIKELY BE FULLY OPERATIONAL WHEN ALLIED NAVAL FORCES ARRIVE. COASTAL MISSILE DEFENSE BATTERIES HAVE ALSO BEEN OBSERVED AT ZHANGZOU, JINMEN, PUTIAN AND LAINJIANG ON THE MAIN LAND. ALSO ANTICIPATE SIGNIFICANT DEFENSIVE NAVAL MINING OF APPROACHES TO PRINCIPAL BEACH HEADS//

GENTEXT/MISSION/ (U) WHEN DIRECTED BY THE NCA, PACCOM WILL CONDUCT OFFENSIVE MILITARY OPERATIONS TO DEFEAT CHINESE FORCES ON TAIWAN.//

GENTEXT/EXECUTION/ COURSES OF ACTION. PACCOM WILL DEVELOP COA THAT SUPPORT THE MISSION WHILE MINIMIZING US CASUALTIES.//

GENTEXT/ETC/...../

Introduction

Operation RED DRAGON may perhaps be an unrealistic scenario, but with the world economic balance of power shifting to Asia and regional stability hinging on a credible US military presence, can one afford to ignore its potential? Such a scenario, involving a credible coastal navy in a littoral maritime theater, presents the operational commander with some complex problems. Most notably, how does a Joint Task Force (JTF) protect its naval expeditionary component? The typical answer would doubtless contain a litany of technological advances and new "miracle" systems that would defend ships from attack. What's more, one would be hard pressed to find a methodology for gaining "littoral control"¹ similar to procedures written on sea control. The "common wisdom" appears to be that US mastery of the high seas will translate into success in the littoral.

Technology alone will not protect forces in harm's way; littoral control must be gained through innovative application of operational design using joint resources. To effectively protect afloat forces, military leadership must develop doctrine which insists that littoral control not be taken for granted. In support of the aforementioned thesis, this paper will examine the nature of the littoral challenge, US military efforts to meet the challenge, and suggest a potential, pragmatic solution to this problem through the application of operational thinking to existing joint force resources.

The Nature Of The Littoral Threat To US Forces

Why We Operate In The Littoral. When the global strategic landscape changed with the fall of the Soviet Union, a new strategy was required to deal with likely future threats. As a result, US Naval leadership developed "...From the Sea," a concept paper recognizing "...the shift in strategic landscape means that naval forces will concentrate on littoral warfare and maneuver from the sea."² The littoral mission may include controlling offshore air and sea approaches to coastal regions, obtaining intelligence, landing special operations forces (SOF), suppressing enemy air de-

fenses, eliminating C² nodes, resupplying forces, and landing Marines to seize and hold vital territory.³ This guidance refocused naval thinking from grand, open ocean, Mahanian battles to warfare in the littoral. In prophetic fashion, "...From the Sea" warns that control of the littoral should not be presumed, but will require focused skills and resources.⁴ Unfortunately, *Pax Americana*⁵ may be leading us to presume mastery of the littoral.

Future Battlegrounds. In a recent PROCEEDINGS article, Marine Corps Commandant General Charles Krulak addressed the pressing questions of why and where the United States would fight in future conflicts. His thoughts were not surprising; he feels that because US economic well-being is dependent on foreign markets, economics will be the vital interest requiring armed conflict. Furthermore, he believes the traditional US "Eurocentric" political and economic focus will shift to Asia: "By 2020 the global economic center of gravity will have shifted from west to east ... 80% of the world's largest economies will be on the Pacific and Indian Ocean rim. ... by the year 2000 our Asian trade will be twice the size of our European trade."⁶ Maritime commerce, which accounts for over 80% of all global trade and exceeds 3.5 billion tons per year, must often pass through coastal waters or straits. As natural resources are depleted and populations continue to grow, nations will seek to enlarge offshore sources of oil and other essential minerals,⁷ creating a hotbed for conflict. This littoral expansion is supported by the fact that since 1979, US Navy ships and aircraft have been required to contest excessive territorial sea claims of more than thirty-five countries, at a rate of thirty to forty "freedom of navigation" operations per year.⁸ Clearly, Asian littoral regions are likely areas of conflict.

Whom We Will Fight. A perfect example of a country that meets the criterion laid out by General Krulak is China. Washington and Beijing have not enjoyed a cordial relationship for most of recent history. Text books are riddled with examples: US exploitation of Chinese markets in the 1800s, US support of the Nationalist Chinese during W.W.II, Chinese attacks on US forces during

the Korean conflict, to name but a few. Moreover, the United States and China operate diametrically opposed political regimes, with differing value systems and constant bickering over trade-related issues.

A growing economy and booming population raise concern over China's ability to provide goods and services, which may force expansion to gain essential natural resources. "China became a net oil importer in 1993. Accordingly, Chinese leaders are bound to be interested in the oil reserves so often thought to lie beneath the South China Sea--and this is usually held to be one of their main policy drivers."⁹ Although it would seem to be in China's interest to put aside dispute in favor of cooperation, one can easily see the potential for conflict as Chinese demand for oil and other resources increases.

The United States must also be aware of the threat that Chinese hegemony over the South China Sea and other navigation choke points would have on Japan. The Japanese believe a Peoples Republic of China (PRC)-regained Taiwan would present a threat to navigation throughout the Taiwan straits.¹⁰ Colonel William V. Kennedy, USA, in a recent PROCEEDINGS article, warns:

If we do not recognize that Taiwan is of vital importance to Japan in the literal sense of the term, we are someday going to be very nearly as surprised and outraged by the ultimate Japanese adjustment to the situation as we were on 7 December 1941. Put bluntly, failure of the United States to support the de facto and ultimately de jure Taiwan independence will be seen by Japan, and not only by Japan, as the final episode in the collapse of US power in East Asia and the Western Pacific.¹¹

The legacy of Peoples Liberation Army Navy's (PLA(N)) forward thinking commander, Admiral Liu Huaqing, is a navy whose doctrine espouses a modernized force and an offshore defensive strategy. He also championed significant improvements in naval C³I systems and officer training. Moreover, China's burgeoning economy will afford the financial means to modernize naval forces, making them a major concern for the US Navy for the future.¹² Trends suggest that "China's voluminous, largely superannuated and slowly modernizing assets may be more than adequate to impress China's southern neighbors,"¹³ and influence US foreign and naval policy. From

this perspective, the PLA(N) must be viewed as a challenge to US leadership in the Asian Pacific region.

When we would fight is difficult to assess. The Center for Naval Analyses, in its work on the Chinese threat, suggests China will not have a blue water navy capable of challenging the US Navy at sea until after the year 2010. This assessment however, was based on an analysis of China alone, not accounting for projected US downsizing. China, like the United States, will fight when it perceives an economic threat un-resolvable through diplomatic means and a minimum military parity with the potential adversary. In assessing Chinese willingness for war, one has only to look back to the Korean War to judge Chinese rationality. With this background information, Operation "RED DRAGON" may seem more realistic; therefore, to continue this estimate of the challenge one must next address the environment.

Characteristics Of The Littoral. In general, coastal regions impose depth of water limitations on naval forces. "Shallow water inhibits maneuverability, and the [shallow water] acoustics spectrum affects our ability to use active or passive sonar for detection and tracking [of submarines]." ¹⁴ Water depth may prohibit some larger classes of ships from entering an area. Even more treacherous for surface ships is a forced transit through choke points. These passages present navigation challenges, vulnerability to mines and shore based defenses, and little stealth. Moreover, shoreline configuration can provide areas for enemy aircraft and helos to hide, create radar blind zones, and restrict overall sensor coverage.

The proximity to shore means an increased number of threats, threat axes, and reduced reaction time. ¹⁵ To reach objectives on shore, forces must operate inside enemy coastal defense envelopes (i.e., radar, Anti-Ship Cruise Missiles (ASCM), missile boats, land-based air, ballistic missiles and mines). In addition, the seacoast region facilitates operation of more surface vessels and diesel submarines. Here, platforms are closer to fuel and re-supply sources, are protected by

overlapping weapons systems, and have access to safe haven. Moreover, threats may appear from many directions simultaneously, thereby increasing the axes that must be watched. As a result, forces must always be prepared to defend against fast, agile, stealthy missiles which can be launched from almost any physical dimension, with the element of surprise nearly every time. Any error, equipment or human, once the missile has acquired a target can be catastrophic.¹⁶

Sensor degradation and uncertainty are magnified in the littoral.¹⁷ Detection capability of current sensors is seriously degraded by land clutter. Land mass sensor returns often generate an abundance of false targets and masking of small, real targets; e.g., "...during Desert Storm Aegis cruisers were saturated with a super abundance of tracks caused by the sensitivity of the SPY-1B radar to land, sand, chaff."¹⁸ Today's systems were build for long range open ocean detection and are less effective at the shoreline. Further, high shipping densities, manmade platforms like oil rigs, and weather related phenomena contribute to poor quality picture inshore. What was clear at 100 nautical miles from the coast, because of the scarcity of traffic and well defined trade routes, becomes cluttered and unpredictable at 50 nautical miles from the beach. The flow of traffic here is confused, and cluttered with numerous small contacts that will "pop-up" on radar displays.¹⁹

Marginally effective sensor performance challenges a tactical commander's decision making capability. The dense target environment makes target classification and identification much more difficult. In coastal waters, unlike airspace, there is no universal waterspace management system with the equivalent of flight plans and terminal control authorities²⁰ that can be used to make reasonable identification assumptions. Electronic support measures, another part of the identification picture, are quickly overloaded with electromagnetic signals that overwhelm both system and operator abilities. A corollary to this condition is that operating near coastal radars (on all the time) significantly increases the challenge of determining when one has been targeted.²¹

Rules Of Engagement (ROE)²² present a difficult problem in the congested littoral. The reduced reaction time requires liberal ROE, yet political concerns and the increased danger of targeting a non-hostile unit may prohibit such flexibility. "In today's more limited conflicts, US public opinion will not accept fratricide. Extraordinary measures, with concomitant ROEs, are [should be] in place to prevent it."²³ Similarly, any violation of international norms regarding collateral damage could destroy cooperation among coalition partners, erode an operation's legitimacy, and adversely affect public opinion. As the difficulty with detecting and recognizing threats has increased, an interesting quandary arises: Do not take the first hit, yet never engage a friend, neutral, or non-combatant.²⁴

Human factors and equipment concerns may become critical weaknesses.²⁵ The limited number of combatant ships allocated to JTFs will require long on-station times at high states of readiness while in the littoral. Admiral Ya'ari of the Israeli Navy contends that the coastal defender enjoys the advantage of timing, in that he may choose when and where to launch an attack, thus requiring ships to stay in a heightened readiness condition, which is taxing and ultimately unsustainable. Crew fatigue in situations that require split second decisions will lead to catastrophe. Besides human exhaustion, modern combat systems equipment requires significant "down time" for maintenance. Excessive delays in equipment maintenance will degrade performance and hazard vessels. "Joint Vision 2010's" grand view of fewer, more lethal platforms, has led to the development of the Arsenal Ship. This concept envisions a prepositioned, large magazine capacity, missile firing platform, continuously on station. This, it is hoped, will reduce the number of Sea Launched Cruise Missile (SLCM) shooting ships required in each battlegroup. One unintended consequence of this idea may be further complication of crew fatigue, performance, and maintenance time concerns for already overburdened surface ships. With the foregoing as principal own-force issues affecting course of action selection, enemy capabilities in the littoral are now addressed.

An Enemy Suited To The Littoral Environment.²⁶ Coastal navies are trained in littoral warfare; they understand their environment, geography, weather, equipment, and US strength. Their weapons and sensor systems are optimized to operate in the seacoast environment. The coastal nation enjoys the same systems available to afloat units--radar, electronic support gear, ASCMs and aircraft--without the same level of vulnerability.²⁷ Moreover, the reduced size of the battlespace allows the defender to create synergy by layering weapons envelopes among many defense options. Available along with the above are mines, shore gun batteries, special forces, and missile fast patrol boats (FPB-M).²⁸ FPB-Ms are essentially mobile ASCM launching platforms capable of high speeds, and hard to detect and destroy in a cluttered littoral environment. FPB-Ms are inexpensive, so small budgets can buy large quantities, which may provide sufficient weapons to saturate an attacker's defensive systems.

Operation DESERT STORM reminds coastal nations of the value of mine warfare first hand. Both USS TRIPOLI (LPH 10) and USS PRINCETON (CG 59) were hit and seriously damaged by inexpensive mines. Moreover, 1200 mines planted off the coast of Ash-Shuaybah effectively prevented the US Navy from landing 1 MEF.²⁹ Mines should be expected as a major component of an opponent's shore defense.

Beyond orthodoxy, the operational commander must be concerned with unconventional warfare techniques. Commander Frank C. Borik, in his article titled "Sub Tzu & the Art of Submarine Warfare," offers some eye opening examples of unconventional naval warfare. The following is a summary of the more important ideas: Saturate sensors with large numbers of decoys, such as false periscope masts and buoys with radar reflectors; vertically launched cruise missiles and intelligence gathering equipment may be hidden within commercial shipping containers; fishing and merchant ships equipped for guerrilla operations to complicate the ID process and negate US air advantage; use fishing or merchant vessels to tow acoustic decoys simulating submarines, seed

periscope decoys or floating reflectors; use fishing vessels with special nets to trawl for submarines.

The preceding examples are not far from reality; "... in 1993, British Aerospace conducted a successful launch of a Sea Skua missile from a 20 meter civilian cabin cruiser."³⁰ This notion of unconventional warfare is also supported by General Krulak:

... landing forces armed with C², tactical mobility, and fire power support capabilities of the present will be hard pressed to decisively engage an enemy who is likely to combine the destructive capability of a conventional force with the elusiveness of a guerrilla.³¹

Finally, the 1982 Falklands War all too clearly illustrates the danger of an unlocated submarine. Although Argentine submarines did not record a torpedo hit on British ships, a significant portion of the operating time of two ASW carriers, more than a dozen frigates and destroyers, four nuclear submarines, and one diesel submarine was diverted from other missions to provide protection.³² In the littoral, submarines will use geography, ocean topography, environmental factors, heavy coastal shipping, and familiarity with the local environment to complicate our anti-submarine efforts.³³ Finally, "Admiral Gorhskov observed that in World War II there were 25 Allied ships and 100 aircraft involved in ASW operations for each German submarine at sea,"³⁴ a resource capability no navy today can field. With a firm grasp of own-force factors and likely enemy capabilities in the littoral, this paper now looks at doctrine and technology for a course of action framework.

US Navy Efforts To Solve The Littoral Problem

Captain Wayne Hughes in his book on fleet tactics describes doctrine as the means by which a commander controls his force before an engagement: "Doctrine is not what is written in the books; it is what warriors believe in and act on."³⁵ As an axiom rigidly grasped by land force leadership, doctrine is difficult for the naval commander, acculturated with the independence of command at sea, to freely accept. Yet today doctrine is essential to ensure proper, acceptable response in crisis actions, particularly in the fast paced littoral environment. To alleviate doctrinal

deficiencies, the US Navy established the Naval Doctrine Command in 1993 and charged it with building this needed tool.

A search for littoral warfare doctrine leads one to Naval Warfare Publication (NWP)-39, Naval Coastal Warfare (NCW) Doctrine. The publication is billed to "...establish the operational level of war doctrine for NCW." The book defines NCW as "...encompassing planning for and conducting operations to ensure strategic mobility and safe operating areas for the United States and Allied forces in coastal and harbor waters during time of war or other contingency operations."³⁶ A review of this NWP-39 leaves the reader disappointed with the lack of complexity and comprehensiveness. For example, only three small paragraphs are devoted to a concept of operations, one three page chapter to NCW operational procedures, and a two-page chapter covering coastal sea control. NWP-39, updated in 1994, has some good points but is shockingly inadequate as doctrine; no other fleet or individual unit level doctrine to support littoral warfare has been developed.³⁷

Joint Doctrine Review: While progress is being made in the areas of theater ballistic missile and air defense, joint doctrine does not specifically address naval operational protection in the littoral. Doctrine for Joint Operations (Joint Pub 3-0) addresses littoral control, but from the perspective of what advantages are to be gained by having control, not how to get it. Joint Amphibious Doctrine (Joint Pub 3-02), while adequate for amphibious operations, does not detail the essential step of gaining littoral control as a prerequisite to landing operations. While the doctrine does mention identifying targets that could threaten naval vessels, its chapter on pre-assault operations falls well short of establishing a firm doctrinal base for acquiring littoral control before a landing is executed. Adequate coverage is given to air control issues and procedures; littoral control, however should be the first step in the process.

Technology: Weapons and sensor systems developed prior to 1990 were designed and optimized for blue water operations against the Soviet Navy. While outstanding in that purpose, these systems have difficulty close to shore. Recognizing this, naval planners have initiated several programs designed to improve weapons system performance in coastal regimes.

Proliferation of ballistic missile launch vehicles has increased the threat and generated much interest in defense systems. Protection from theater ballistic missiles (TBM) is vital to ensure the ability to safely enter a hostile overseas theater, as well as to protect forces already ashore during the early phases of a conflict. Armed with TBMs, an enemy could disrupt a US coalition response unless an effective counter is fielded. Ballistic missile attacks against littoral forces, ports, airfields, storage facilities, and staging areas could make it costly to project forces into a disputed theater, much less carry out operations to defeat a well-armed aggressor.³⁸ In addition, a credible TBMD is needed to reduce proliferation of ballistic missile technology.³⁹ Sea-based TBMD systems offer the operational commander a TBM umbrella so large that, for example, from a few stations in the Sea of Japan, ships could provide operational protection for US forces in most of the Republic of Korea and Japan.⁴⁰ In recent operations near the coast of Taiwan, USS BUNKER HILL successfully tracked and recorded data on all four M-9 missiles China fired near Taiwan, thereby proving the value of the technology.

Cooperative Engagement Capability (CEC) provides synergetic engagement of targets, extends the battle space, and multiplies force combat power through data sharing technology. In this system, needed fire control information such as target bearing, range, and altitude are processed from numerous platforms to create a single distributed theater air defense system.⁴¹ CEC has also demonstrated real time data exchange between ships and US Army MIM-104 Patriot missile units and USMC MIM-23 Hawk batteries ashore.

Ship self-defense improvements will provide integrated sensor and weapons systems designed to enhance freedom of action in the littoral by improving defense against attack by aircraft, ASCMs, and small surface threats. Technological advances include improved detection, control, and engagement systems. The results of these efforts are enhancements in ability to detect low-observable targets by existing radar suites, computer based decision tools such as Rapid Anti-Ship Missile Integrated Defense System (RAIDS) to increase speed of response, and enhanced engagement systems such as "Evolved" NATO Sea Sparrow point defense missile system (ESSM), the Rolling Airframe Missile (RAM), and upgraded Close in Weapons System (CIWS).⁴²

The grim threat posed by diesel submarines operating in the littoral forced the US Navy to bolster its shallow water ASW capability. Besides refined shallow water weapons and tactics development, the Navy has sought to improve detection capability through the Advanced Deployable System (ADS). ADS will provide surveillance of the battlespace around the task group in real time, and transmit the data to regional centers and joint commands ashore or afloat. This system will also provide the opportunity to cue other ASW assets.⁴³ Although progress had been made, it remains unclear whether technology or sheer force numbers offer an answer to the ASW problem. History offers a compelling indicator that quantity of platforms is also necessary to solve the anti-submarine issue.

Lessons learned during DESERT STORM highlighted the US Navy's inability to deal with large numbers of naval mines. This flaw generated significant development in the Navy's mine sweeping capability. David Foxwell's Jane's International Defense Review article notes some of the US Navy's mine warfare improvement projects:⁴⁴ Remote Mine Hunting System (RMS), Coastal Battlefield Reconnaissance & Analysis (COBRA), Rapid Airborne Mine Countermeasures System (RAMICS), Explosive Neutralization Advanced and Technology Demonstration (ENATD), to name just a few.⁴⁵ Even though these technological advancements appear impressive, the Navy

is still plagued by a shortage in numbers and the transport necessary to quickly get an effective mine countermeasure capability in theater.

While it is easy to become awed by technology, one must also be concerned with a phenomenon this author calls the “technological tail chase.” The systems designed to improve operational protection sound, and are, impressive. However, one must consider that to build a defensive system, the engineer knows the capabilities and operating characteristics of the threat system. This implies that the offensive weapon is already built and significant intelligence gathering efforts have produced reliable technical data. But, as the defender is developing countermeasures, the attacker is improving his existing weapons, thus requiring the defender to begin the cycle again.⁴⁶ Therefore, defensive measures will usually lag the systems they are designed to oppose. Furthermore, technology-based solutions are supported by two additional assumptions. First, systems will perform to design specification most of the time. Second, systems will not reach what one might call the “end point of defense” where they no longer have the capacity to deal with the number of targets presented, and consequently will be overwhelmed. Thus, operational protection is not achievable through machines alone.⁴⁷ Further, current technology and doctrine together cannot adequately address the problem of protection in the littoral; one must turn to application of operational art for optimal courses of action.

Potential Solutions At The Operational Level Using Joint Resources

Solutions should be multi-faceted, not relying solely on technology but incorporating its advantage in a sound operational design developed by a creative leader. These next few paragraphs will set a framework for tackling the operational protection issue. The Army defines operational protection as:

Actions that conserve the fighting potential of a force so that it can be applied at the decisive time and place. It includes actions taken to counter the enemy's firepower and maneuver by making soldiers, systems, and operational formations difficult to detect, strike, and destroy.

From the naval perspective, when operating in the near shore environment, this concept must be taken one step further to include control of the littoral. Without littoral control and a constant effort to maintain it, naval forces will be vulnerable to enemy counter-measures. Littoral control as a stepping stone for further land based actions must be included as an opening discussion point in any operation contemplated in this region. Using Joint Vision 2010's concept of full dimensional protection as a point of departure, efforts to protect forces may be thought of in two distinct categories, passive and active.

Passive means will seek to posture the force to minimize the threat. Measures should include at a minimum: Establishing a maritime exclusion zone, intelligence preparation of the battlefield, and review of essential planning considerations.

Commanders should seek to isolate the area of operations by means of a maritime (or total) exclusion zone (MEZ). MEZs have been justified, at least in part, as reasonable, albeit coercive, measures to contain the geographic area of the conflict or to keep neutral shipping at a safe distance from areas of actual or potential hostilities.⁴⁸ The Commander's Handbook on the Law of Naval Operations (NWP 1-14M) states that MEZs are lawful as long as they are established to warn vessels away from combat activities or to reduce exposure to collateral damage without unreasonably interfering with legitimate neutral commerce. The Handbook goes on to declare that creation of an MEZ does not relieve the proclaiming belligerent of its responsibility to ensure only lawful targets are engaged.⁴⁹

Given the limitations of MEZs, geography is the most important factor in determining if a zone will have value. MEZs in areas of dense merchant shipping will afford the commander a potential reduction in the number of vessels that must be tracked and identified, and will reduce the probability of engaging an unlawful target. MEZs established in sparsely traveled areas offer little

benefit. While not a panacea, MEZs have potential benefit and should be included in any operations plan.

Intelligence preparation of the battlefield is crucial to the success of any operation in coastal waters. Sound intelligence may help reduce or even neutralize the effectiveness of enemy response options. Knowledge of shore defenses will increase the lethality of own operations to destroy enemy weapons systems. Staff J2s must ensure national reconnaissance systems are focused on the intended area of operation. Essential information requirements should include analysis of enemy unconventional warfare methods, C² nodes, ASCM sites, mine fields, coastal surveillance facilities, ballistic missile launch sites, naval and air bases, and integrated air defense systems. Own efforts may include submarine-deployed Special Operations Forces (SOF) for reconnaissance, mapping of shore defenses, and synchronized destruction of those same defense measures.

Along with intelligence planning, innovative application of operational art methods should be considered when planning littoral operations. Careful phasing of the operation is essential to success. Like the US Maritime Strategy of the Cold War, a littoral strategy that calls for land force projection ashore should follow a sequential three phased approach. First, control the littoral; in other words, make the area safe.⁵⁰ Second, land the power projection force, and third, support the land force ashore. In this phased approach forces afloat are protected, vital sea lines of communication (SLOCs) to forces ashore are secure, and premature establishment of a land component is prevented. This paper will address only the littoral control phase because adequate doctrine exists to support follow on phases.

Sequencing⁵¹ and synchronization⁵² within given phases must work in concert to ensure a fast paced tempo to overwhelm enemy C² and weapons responses. The littoral control sequence would include a time line for offensive counter coastal defense (OCCD) operations including: Air superiority, strike missions, ASW and Surface Warfare (SUW) activities, and mine clearance. Op-

erational leadership should ensure the tempo of actions is quick and decisive. Within a given sequence, attacks should be coordinated between sea and land based air, SLCMs, and SOF, to ensure enemy defenses are overwhelmed by superior combat power applied simultaneously along multiple axes. By planning a synchronized effort, one may achieve both dispersion and concentration of force at the same time, i.e., launching platforms remain safely dispersed outside the defender's weapons envelope, while weapons (SLCMs, air assets, SOF) concentrate on designated targets.

Operational and/or tactical deception⁵³ is another element that may help isolate the operating area. A good deception plan will force an adversary to prepare defenses and execute patrols in areas other than the intended landing zone. On the other hand, a coastal nation's geography may be such that there are only one or two suitable landing sites; in this instance, the deception plan should serve to confuse the enemy concerning the time of landing. The goal of the deception plan is to achieve surprise. While surprise should not be an element essential to the success of an operation, when combined with speed and impact of the initial strike, it may confuse and rupture the adversary's decision making capability.

Army FM 100-5 touts the necessity for maintenance and unit rotation schedules as an essential element of operational protection. By addressing such issues in the operations order, forces inside threat envelopes will remain focused and materially prepared to fight. Furthermore, some thought should be given to how task units are organized. While most ships have multi-mission capability, the human mind is less suited to handle multiple tasks simultaneously. Therefore, if asset levels allow⁵⁴, task units should be organized around one mission area such as ASW or AAW in mutually exclusive yet mutually supporting roles, rather than considering each naval ship capable of all mission areas all the time.⁵⁵

Geography: In addition to what is found in military doctrine on selection of amphibious landing sites, the commander must also consider the effect geography will have on the naval com-

ponent of the JTF. In other words, geography/hydrography must be balanced between what is required to execute a successful landing and what is required to ensure forces operating at sea are safe. For example, to mitigate the problems with shallow water ASW and improve chances against a diesel submarine, deep water operating areas should be chosen,⁵⁶ if possible.

Active means will include efforts to locate and destroy opposing forces, disrupt enemy decision making, and create a safe operating envelope. One possible method would be to use an asymmetric response in the form of a littoral "blitz" designed to produce "operational shock." Asymmetrical actions involve employing one's force against a dissimilar hostile force,⁵⁷ for example naval and air forces against land forces. This blitz would seek to isolate the littoral, before the enemy has the opportunity to react, by destroying or neutralizing not only his resources but also his mind.⁵⁸ Operational shock will be the result of rapid, system-wide physical and psychological breakdown similar to the confusion and impotency France displayed against the German tank blitz in 1940. The means used to create this effect may be arranged in any number of ways, and are only limited by the creativity and innovation of the operational staff.

As an example of a littoral blitz, one might begin with concentrated SLCM and air strikes on enemy decisive points including: C² nodes, shore ASCM sites, integrated air defense systems, and submarine and FPB-M facilities. This initial strike could be followed by seeding of area denial mines to prevent mobile cruise missile sites from reentering cleared areas. Battlespace isolation efforts could include B-52s or submarines employed as offensive mine layers to create barriers on either side of the intended approach lane. The goal would be to reduce the surface and submarine threat. In areas where geography precludes sea mining, mines could be used to block harbors. Moreover, selective overt offensive mining of departure lanes would be especially effective where vessels are constrained to a channel. Enemy platforms trapped by the mines could be engaged by

aircraft while trapped submarines could be subjected to saturation bombing with cheap depth charges or iron bombs.

Once barriers have been established, mine sweeping and ASW platforms under cover of AAW and ELW units, electronic attack aircraft, and CAP could proceed into the area. Surface warfare action groups with helicopters for surveillance could be stationed just inside the mine barrier to query and sink potential leakers. In addition to a surveillance mission, helicopters could be used to provide maneuverable firepower capable of quickly neutralizing surface targets: "... during DESERT STORM, Army observation helicopters with guns, rockets and the Hellfire missile ... guided by LAMPS III and surface ships provided an attack capability over large areas of the littoral."⁵⁹ Additional protective measures could include assigning aircraft linked to U2s, UAVs, national intelligence systems, or other cueing platforms, to act as quick response strike platforms to destroy any active mobile ASCM sites. Furthermore, conventional air defense procedures, including TBMD, may be employed at this point. After control of the littoral has been secured, movement of amphibious forces ashore could begin.

Once initial control of the area has been attained, efforts are necessary to maintain protection of forces. Small combatants, including Coastal Patrol vessels (PCs), can be organized into hunter-killer elements under the direction of airborne LAMPS helicopters. They can act as a quick reaction force to intercept and query potential threats before they enter the area of operations. Since the number of combatant ships assigned to aircraft carrier battlegroups has been reduced, early requests for US Coast Guard patrol craft are essential to ensure sufficient force for hunter-killer operations. One may also consider using Army/Navy helicopters manned with special forces teams that could be fast roped to a suspect vessel to search, positively mark,⁶⁰ or destroy it.

Attack activities would include efforts to neutralize enemy ability to deploy and employ command and control and C⁴I resources. These would include: SOF action to destroy fuel bunkers,

C² nodes, pier facilities, navigation aids, and carrier or land based air in an operational fires role to attack support infrastructure outside the area of operations. Within the scope of a deception plan, air assets could be used for surveillance and harassment of enemy mine laying vessels. This attack operation should be done well enough in advance to affect the enemy's mining effort. Finally, naval and land based special purpose aircraft could be used to disrupt the enemy's ability to freely use the electromagnetic spectrum.

↳ Conclusion.

It is debatable whether "Operation RED DRAGON" is realistic. What is irrefutable, though, is that the United States will be called on to send its forces into littoral regions. This environment presents commanders with many challenges not seen on the high seas. For the United States to safely operate in this arena, protection of forces through the application of littoral control should be the first objective of any such operation. Doctrine and technology concerning protection in the littoral have significant shortcomings. Operational protection at present relies heavily on US ability to produce defensive systems capable of countering potential threats, which is dangerous when one considers technology assumptions and the "tail chase" concept. While we focus on one threat, the danger that we will be surprised, and perhaps defeated, by another greatly increases.⁶¹ Technology is not a panacea for alleviating the danger of operations in the littoral. Any solutions must include a combination of technology and doctrine orchestrated with innovative arrangement of operational design elements. As a starting point, doctrine must be developed that addresses the differences between operations on the high seas and in the littoral, and also provides a methodology to achieve littoral control.

NOTES

¹ This author intends the term "littoral control" to mean the ability to protect forces and freedom of movement in the littoral. Actions in support of this condition will focus on destruction of enemy forces that may threaten units operating in the littoral. See CAPT. Wayne P. Hughes, Jr. Fleet Tactics: Theory and Practice. (Annapolis, MD: Naval Institute Press, 1986), 220, for similar definition of sea control.

² "...From the Sea: Preparing the Naval Service for the 21st Century." (Washington, DC: US Department of the Navy, September 1992), 10.

³ Joseph C Strasser, "The Role of Naval Forces in Combat." In Naval Forward Presence and the National Military Strategy, Robert L. Pfaltzgraff, Jr. and Richard H. Schultz, Jr., eds. (Annapolis, MD: Naval Institute Press, 1993), 254.

⁴ "...From the Sea," 5.

⁵ *Pax Americana*, like *Pax Britannia* of the 19th Century, where Great Britain enjoyed uncontested command of the high seas, is intended to be the 20th Century equivalent for the United States.

⁶ GEN. Charles C. Krulak, USMC. "Operational Maneuver From the Sea." Naval Institute Proceedings, January 1997, 26-27.

⁷ Carlos R. Hollifield. "Littoral Warfare: The Transformation of US Naval Strategy to Meet the 21st Century." Unpublished research paper, US Army War College, Carlisle Barracks, PA: March 1996, 4-5.

⁸ Hollifield, 15.

⁹ Geoffrey Till. "China: its Navy and the South China Sea." RUSI Journal, April 1996, 47.

¹⁰ COL. William V. Kennedy, USA. "We Must Support Independence." Naval Institute Proceedings, November 1996, 62.

¹¹ Kennedy, 63.

¹² Jeffrey Goldman. "China's Mahan." Naval Institute Proceedings, March 1996, 45.

¹³ Thomas Hirschfeld. "The Year of the Rat." Naval Institute Proceedings, May 1996, 58.

¹⁴ Brian V. Buzzell, CAPT., USN, and RADM. Ray Walsh, USN. "Helicopters Meet Surface Littoral Warfare Challenge." Naval Institute Proceedings, September 1996, 50.

¹⁵ John F.G Wade. "Navy Tactics, Doctrine, and Training Requirements for Littoral Warfare." Unpublished research paper, US Naval Postgraduate School, Monterey, CA: June 1996, 22.

¹⁶ Yedida Ya'ari, RADM. IN. "The Littoral Arena: A Word of Caution." Naval War College Review, Vol. XLVII, No. 2 (Spring 1995), 11.

¹⁷ Wade, 23.

¹⁸ Ibid., 39.

¹⁹ Phillpott, Scott Jon. "Symmetries and Asymmetries in Littoral Warfare: Can Combatants Go It Alone?" Unpublished research paper, Naval War College, Newport RI: November 1996, 4.

²⁰ Buzzell and Walsh, 50.

²¹ Wade, 23.

²² Ibid., 24.

²³ Buzzell and Walsh, 53.

²⁴ Ibid.

²⁵ Wade, 25.

²⁶ Ibid., 25-28.

²⁷ Ya'ari, 8.

²⁸ Ibid.

²⁹ John Jordan. "Littoral Warfare--The Shape of Things to Come?" Jane's Intelligence Review, March 1993, 141.

³⁰ Phillpott, 13.

³¹ Gen. Charles C. Krulak, USMC. "Operational Maneuver From the Sea: A Concept Paper for the Projection of Naval Power Ashore." Washington DC: Headquarters US Marine Corps, ND, 4.

³² Joseph Lodmell. "It Only Takes One." Naval Institute Proceedings, December 1996, 30.

³³ Lodmell, 31.

³⁴ Ibid., 32.

³⁵ Hughes, 28.

³⁶ Naval Warfare Publication 39, NWP-39 (Rev. A), Naval Coastal Warfare Doctrine, Department of the Navy, Washington, DC: August 1994, 1-1.

³⁷ Wade, 45.

³⁸ Ronald R. Fogleman. "Theater Ballistic Missile Defense." Joint Force Quarterly, Autumn 1995, 75.

³⁹ "Naval Theater Ballistic Missile Defense: Filling an Urgent Need." Program Executive Office (Theater Air Defense) pamphlet. Washington, DC: Department of the Navy, 1996, 1-2.

⁴⁰ Ibid., 6.

⁴¹ David Foxwell. "Tasks and Threat Multiply for Amphibious Forces." International Defense Review, March 1996, 53.

⁴² "Ship Self Defense: An Imperative for Littoral Warfare" Program Executive Office (Theater Air Defense) pamphlet. Washington, DC: Department of the Navy, 5 September 1996, 6-8.

⁴³ Foxwell, 54.

⁴⁴ Ibid.

⁴⁵ Further explanation of these systems: Remote Mine Hunting System (RMS)--semi submerged diesel driven underwater vehicle equipped with forward looking sonar, volume search sonar, and synthetic aperture sonar capable of detecting buried mines while providing a real-time, remote operated reconnaissance and avoidance capability for ships. Coastal Battlefield Reconnaissance & Analysis (COBRA)--USMC program capable of detecting mines in the surf zone, and mines, ob-

stacles and fortifications ashore. Rapid Airborne Mine Countermeasures System (RAMICS)--20mm machine gun fire to destroy sea and land mines in shallow water or the surf zone. Explosive Neutralization Advanced Technology Demonstration (ENATD)--capability to explosively neutralize anti-invasion and anti-tank mines in the surf or beach zone.

⁴⁶ Ya'ari, 12.

⁴⁷ Joint Vision 2010 provides a vision of future direction concerning, among other concepts, operational protection. One takes away from a reading of this document an over-reliance on technology to compensate for reduced force levels. While this may be a budgetary reality, it is dangerous to assume we will enjoy a technological advantage into the future. Some of the key points of the program: Commanders will be able to attack targets successfully with fewer platforms and less ordnance, while achieving objectives more rapidly with reduced risk. In the littoral, this also has the potential to stop an operation if one platform is destroyed or damaged. To cope with more lethal systems and improved targeting, our forces will require stealth and other means of passive protection, along with mobility superior to the enemy's ability to retarget or react to US forces. Passive means are acceptable in peace time, but less useful against mobile targets (naval units in the littoral). Moreover, the geography of the littoral inhibits movement. Increased dispersion and mobility are possible offensively because each platform or individual warfighter carries higher lethality and greater reach. How does this jibe with the principal of mass or concentration of force? This also assumes a defender will not have a credible capability to counter our advance weaponry. Full dimensional protection will be built upon superiority which will provide multidimensional awareness and assessment, as well as identification of all forces in the battlespace. Is this possible in the littoral? Too many forces not easily identifiable operate there; moreover, assessment is based on an estimate of an enemy course of action, which in the fog of war can never be predicted with 100% accuracy.

⁴⁸ The Commander's Handbook, par. 7.9.

⁴⁹ The Commander's Handbook, par. 7.9. The Handbook identifies three fundamental law of war principals that are the basis for the law of targeting. First, the right of belligerents to adopt means of injuring the enemy is not unlimited; second, it is prohibited to launch attacks against that civilian population as such; and third, distinction must be made between combatants and non-combatants, to the effect that non-combatants are spared as much as possible. From these fundamentals, without going into the specifics of targeting, we can draw many important conclusions; first and foremost, commanders will not be able to establish "free fire zones" (as is often thought a MEZ constitutes) because positive identification is essential.

⁵⁰ "Safe" may be defined as free of threats to US centers of gravity. While unlikely that all threats can be neutralized, a safe environment would be one in which existing platforms have superior defense capability.

⁵¹ "Naval War College JMO Glossary of Operational Terms." An Unpublished Paper. U.S. Naval War College, Newport, R.I.: 1996, 24. Sequencing is defined as the arrangement of events within a given combat action aimed to create overwhelming combat power that will most likely accomplish the assigned tactical, operational, or strategic objective.

⁵² *Ibid.*, 27. Synchronization is defined as the arrangement of actions by one's own and friendly forces in time, space, and purpose to produce the maximum relative combat power at the decisive place and time critical to overwhelm enemy C2 and weapons response.

⁵³ Ibid., 7. Operational deception is defined as efforts to target the opposing commanders' preparations and intentions for using military force to accomplish defensive or offensive operational missions.

⁵⁴ The commander should be concerned with economy of force within the given theater. If this is the most essential operation in a given theater, then every effort should be made to ensure maximum concentration of force is devoted here. Secondary areas of effort receive the "economy".

⁵⁵ Defensive support tactics could be developed for warships engaged in operations in support of littoral control: For example, an Aegis cruiser "riding shotgun" for ships involved in mine sweeping or ASW operations conducted inside coastal defense battery ranges. If this is done, individual ship performance will improve.

⁵⁶ Lodmell, 33.

⁵⁷ Milan Vego. "Operational Synchronization." An Unpublished Paper, U.S. Naval War College, Newport, R.I., September 1996, 2.

⁵⁸ Krulak, 28. I am endorsing this type of procedure for use in the littoral as a way of disrupting an enemy's C2 coordination similar to the German blitzkrieg of WW II fame. In 1940, numerically superior French forces in fixed defensive positions were driven into chaos and quickly defeated by the speed and ferocity of an attacking German force. I believe a similar case exists in the littoral which can be overcome by a similar strategy on the water.

⁵⁹ Ibid., 53.

⁶⁰ These forces could be used to plant covert electronic devices that would emit a signal indicating they had been searched.

⁶¹ Krulak. "Operational Maneuver From the Sea: A Concept Paper for the Projection of Naval Power Ashore," 2.

BIBLIOGRAPHY

Books

- Hughes, Wayne P. Jr., CAPT., USN (Ret.). *"Fleet Tactics: Theory and Practice."* Annapolis, MD, Naval Institute Press, 1986.
- Norman, Albert. *"Operation Overlord: Design and Reality."* Harrisburg, PA: The Military Service Publishing Company, 1952.
- Strasser, Joseph C. "The Role of Naval Forces in Combat." In *Naval Forward Presence and the National Military Strategy*. Robert L. Pfaltzgraff, Jr. and Richard H. Schultz, Jr, eds. Annapolis, MD: Naval Institute Press, 1993, pp. 251-263.

Joint Publications

- The Joint Chiefs of Staff. *Joint Pub 3-0 Doctrine for Joint Operations*. Washington, DC: Government Printing Office, February 1995.
- The Joint Chiefs of Staff. *Joint Pub 3-02 Doctrine for Amphibious Operations*. Washington, DC: Government Printing Office, 8 October 1992.
- The Joint Chiefs of Staff. *Joint Vision 2010*, Washington, DC: ND.

Navy Publications

- _____. "...From the Sea: Preparing the Naval Service for the 21st Century," Washington, DC: US Department of the Navy, September 1992
- _____. "Forward...From the Sea," Washington DC: US Department of the Navy, September 1994.
- _____. Naval Doctrine Publication 1, "*NDP-1 Naval Warfare*," Naval Doctrine Command, Norfolk, VA: March 1994.
- _____. Naval Doctrine Publication 5, "*NDP-5 Naval Planning*," Naval Doctrine Command, Norfolk, VA: January 1996.
- _____. Naval Warfare Publication 11, "*NWP-11 (Rev. F) Naval Operational Planning*," NWP Department of the Navy, Washington, DC: September 1991.
- _____. Naval Warfare Publication 1-14M, "*NWP 1-14M The Commanders Handbook on the Law of Naval Operations*," NWP Department of the Navy, Washington, DC: October 1995.
- _____. Naval Warfare Publication 39, "*NWP-39 (Rev. A) Naval Coastal Warfare Doctrine*," NWP Department of the Navy, Washington, DC: August 1994.
- _____. "*Naval Theater Ballistic Missile Defense: Filling an Urgent Need*," Program Executive Office (Theater Air Defense) pamphlet. Washington, DC: Department of the Navy, 1996.

_____. "Ship Self Defense: An Imperative for Littoral Warfare," Program Executive Office (Theater Air Defense) pamphlet. Washington DC: Department of the Navy, 5 September 1996.

Krulak, Charles C., GEN., USMC. "Operational Maneuver From the Sea: A Concept Paper for the Projection of Naval Power Ashore." Washington, DC: Headquarters US Marine Corps, ND.

Wilhelm, Alfred D. Jr. "China and Security in the Asian Pacific Region Through 2010." Alexandria, VA: Center for Naval Analyses, 1996.

Yung, Christopher D. "People's War at Sea: Chinese Naval Power in the Twenty-First Century." Alexandria, VA: Center for Naval Analyses, 1996.

Periodicals

Bodensky, Yossef. "PRC Revives Military Threat to Taiwan as a Prelude to Wider Expansion." Defense and Foreign Affairs Strategic Policy, Jul-Aug 1995, 6-11.

Borik, Frank C., CDR, USN. "Sub Tzu & the Art of Submarine Warfare." Naval Institute Proceedings, November 1995, 64.

Buzzell, Brian V. CAPT., USN and RADM Ray Walsh, USN. "Helicopters Meet Surface Littoral Warfare Challenge" Naval Institute Proceedings, September 1996, 50.

Casey, Merrick, and Loren Thompson. "War Games and Future Realities: PRC Navy Flexes its Muscle." Sea Power, September 1995, 17-18.

Eikenberry, Karl W. "Does China Threaten Asian Pacific Regional Stability." Parameters, Spring 95, 82-103.

Fogleman, Ronald R. "Theater Ballistic Missile Defense." Joint Force Quarterly, Autumn 1995, 75.

Foxwell, David. "Tasks and Threat Multiply for Amphibious Forces." International Defense Review, March 1996, 53-54.

Goldman, Jeffrey B., LCDR, USN. "China's Mahan." Naval Institute Proceedings, March 1996, 44.

Hirschfeld, Thomas. "The Year of the Rat." Naval Institute Proceedings, May 1996, 56.

Hottenrott, Carol, LCDR, USN. "Moving Sea Power Ashore." Naval Institute Proceedings, May 1996, 68.

Jordan, John. "Littoral Warfare--The Shape of Things to Come?" Janes Intelligence Review, March 1993: 140.

Kenny, Henry J. "The South China Sea: A Dangerous Ground." Naval War College Review, Vol. XLIX, No. 3 (Summer 1996), 96.

Kennedy, William V., COL., USA. "We Must Support Independence." Naval Institute Proceedings, November 1996, 61.

Krulak, Charles C., GEN., USMC. "Operational Maneuver From the Sea." Naval Institute Proceedings, January 1997, 26.

Lodmell, Joseph, CDR, USN. "It Only Takes One." Naval Institute *Proceedings*, December 1996, 30.

McVadon, Eric A. "China: An Opponent or Opportunity." *Naval War College Review*, Vol. XLIX, No. 4 (Autumn 1996): 75-92.

Peters, Ralph. "Our Soldiers, Their Cities." *Parameters*, Spring, 1996: 43-50.

Till, Geoffrey. "China: Its Navy and the South China Sea." *RUSI Journal*, April 1996, 45.

Ya'ari, Yedida, RADM IN. "The Littoral Arena: A Word of Caution." *Naval War College Review*, Vol. XLIVII, No. 2 (Spring 1995): 7.

You, J.T. "Chinese Navy and Regional Stability." *Asian Defense Journal*, September 1995, 12-13.

Zalamea, Ulysses O. "Eagles and Dragons at Sea: The Inevitable Strategic Collision between the United States and China." *Naval War College Review*, Vol. XLIX, No. 4 (Autumn 1996): 62-74.

Unpublished Papers

Hollifield, Carlos R. "Littoral Warfare: The Transformation of US Naval Strategy to Meet the 21st Century." Unpublished research paper, US Army War College, Carlisle Barracks, PA: March 1996.

Phillpott, Scott Jon. "Symmetries and Asymmetries in Littoral Warfare: Can Combatants Go It Alone?" Unpublished research paper, Naval War College, Newport RI: November 1996.

Wade, John F.G. "Navy Tactics, Doctrine, and Training Requirements for Littoral Warfare." Unpublished research paper, US Naval Postgraduate School, Monterey, CA. June 1996.